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Committee on Energy and Natural Resources for Development

Report on the first session

5–16 April 1999

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Note

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Chapter I

Matters calling for action by the Economic and Social Council or brought to its attention

A. Draft resolutions for adoption by the Council

1. The Committee on Energy and Natural Resources for Development recommends to the Economic and Social Council the adoption of the following draft resolutions:

Draft resolution I

Contribution to the preparation of the report of the Secretary-General on progress made in providing safe water supply and sanitation for all during the 1990s

The Economic and Social Council,

Recalling General Assembly resolution 50/126, in which the Assembly requested the Secretary-General to submit a report through the Commission on Sustainable Development and the Economic and Social Council to the General Assembly at its fifty-fifth session, containing an assessment of the water supply and sanitation situation in developing countries, including proposals for action for the ensuing decade at the national and international levels,

Also recalling the progress that has been made in water supply and sanitation,

Further recalling the importance given to integrated water resources management in Agenda 21,[1]

Noting the need for progress in the alleviation of poverty and the links between poverty and the lack of drinking water and adequate sanitation;

Further noting the lack of adequate progress that has been made in providing sanitation and the negative impacts on human health and the health of ecosystems,

1. *Requests* the Secretary-General in the preparation of his report to:

(a) Ensure that the connections between water supply and sanitation and other sectors are explored;

(b) Focus the report on an analysis of the shortfalls, including an analysis of the barriers, to progress in providing water supply and sanitation;

(c) Explore how inadequate attention to an integrated approach to water and land management can exacerbate problems of water supply and sanitation and vice versa;

(d) Emphasize the analysis of issues;

(e) Explore topics where adequate progress has not been made and identify actions and examples of efforts that have been successful;

2. *Requests* that the following issues, as elaborated in the annex to the present resolution, be included in the analysis:

(a) Mobilization of political will;

[1] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3–14 June 1992*, vol. I, *Resolutions Adopted by the Conference* (United Nations publication, Sales No. E.93.I.98), resolution 1, annex II.

(b) Economic sustainability and private-sector involvement in water supply and sanitation;

(c) Community participation and social mobilization;

(d) Sanitation, sewage treatment and wastewater recycling;

(e) Communication and awareness-training;

(f) Gender issues;

(g) Protection of water sources;

(h) Water conservation efforts.

Annex

Issues for inclusion in the report of the Secretary-General on progress made in providing safe water supply and sanitation for all during the 1990s

The Committee on Energy and Natural Resources for Development decides to recommend that the following issues be included for analysis in the report of the Secretary-General on progress made in providing safe water supply and sanitation for all during the 1990s:

1. The need to mobilize political will to accomplish water supply and sanitation objectives and integrated land and water resources management, including:

(a) The need for a clear policy framework for water supply and sanitation, which recognizes the fundamental role of water supply and sanitation to socio-economic development and incorporates these considerations in basic development planning, including a commitment to the mobilization of public and private funding for this effort;

(b) The need to incorporate water supply and sanitation in a broader integrated land and water resource management strategy;

(c) The need to pay attention to the most vulnerable groups in society;

(d) The need to give priority to addressing sanitation issues where they are lagging;

2. The need for economic sustainability and private-sector involvement in water supply and sanitation, including:

(a) The need for a clear and transparent policy and management framework which facilitates private-sector involvement, while protecting environmental and social concerns through transparent regulatory and administrative guidelines;

(b) The need for a commitment of public funding to assist in the provision of water supply and sanitation to the most vulnerable groups;

(c) Community participation and social mobilization, including:

(i) The need for a national policy framework which facilitates community participation in decision-making and contributions by beneficiaries;

(ii) The need for a policy framework that encourages, as appropriate, community participation in the construction, management and operations of water supply and sanitation projects;

(iii) The need to include socio-economic studies as a part of the initial planning process for water supply and sanitation projects;

(iv) The need to link the provision of water supply and sanitation service to demonstrated needs;

(v) The need to link community education and awareness-raising efforts to community participation efforts and to encourage the use of local inputs;

(vi) The need to promote public sector-private sector partnerships;

(vii) The need to strengthen local capacity and participation in monitoring and assessing water resources, including water quality;

(viii) The need to strengthen the capacity of the most vulnerable in society to participate in water supply and sanitation planning and decision-making;

(ix) The need to review various models of basin management and participation, including basin agencies and organizations, catchment councils, integrated watershed management efforts and international cooperation;

(d) Sanitation, sewage treatment and wastewater recycling, including:

(i) The chronic under-funding of these issues;

(ii) The costs, benefits and trade-offs of various treatment levels and the extent of coverage considering limited financial resources;

(iii) The problems of mixed domestic/industrial/storm-water systems;

(iv) The potential of industrial water recycling and pre-treatment before transfer to municipal systems;

(v) The potential for wastewater use for agricultural purposes;

(e) Communication and awareness-raising, including:

(i) The need to set aside support for water and hygiene education and communication efforts associated with technical and construction projects;

(ii) The need to use all appropriate existing and emerging communication channels (e.g., radio, television, newspapers, Internet and public information campaigns);

(iii) The need to use local networks (e.g., religious leaders, health and extension workers, women's groups, youth associations and sports clubs);

(iv) The need to use the educational system at all levels, with special emphasis on youth and women;

(v) The need to identify target populations to maximize the benefits of education outreach;

(vi) The need to assess existing data-collection and information management to ensure that it meets management and decision-making requirements;

(f) Gender issues, including:

(i) The need to ensure women's full participation in all aspects of land and water resource management, including decision-making;

(ii) The need for gender-disaggregated data in water supply and sanitation planning, monitoring and evaluation;

(g) Protection of water sources, including:

(i) The need to examine the extent to which water supply programmes can be linked to protection of the catchment which is the source of the water (e. g., the Quito, Ecuador, water supply);

(ii) The need for protection of headwater forests and wetlands to moderate stream flow and facilitate groundwater recharge;

(iii) The need for an ecosystem approach to water supply and sanitation planning;

(iv) The need for water quality monitoring and dissemination of information, including on manufactured and natural contaminants, such as harmful trace elements and heavy metals (e.g., arsenic in South Asia), and for the identification of sources of contaminants;

(v) The need to protect water sources and their catchments from pollution, examining the potential for incentives, regulation, administrative measures and intersectoral coordination;

(vi) The need to regularly update and disseminate hydrological information;

(h) Water conservation efforts, including:

(i) The need to examine leakage in water distribution and sewage lines;

(ii) The need to examine demand management programmes to moderate demand and wasting of water;

(iii) The need to encourage the adoption of water savings devices;

(iv) The need to give high priority to water conservation in national land and water policies;

(v) The need to develop and transfer appropriate water conservation technologies and to encourage the use of local resources in their application;

(vi) The need to include water conservation efforts in water balance calculations for basin management.

Draft resolution II

Contribution to the preparatory process for the eighth session of the Commission on Sustainable Development: integrated planning and management of land resources and agriculture

The Economic and Social Council,

Recalling its resolution 1998/46 of 31 July 1998, by which it directed the Committee on Energy and Natural Resources for Development, in formulating its programme of work, to take into full account the multi-year programme of work of the Commission on Sustainable Development, so as to ensure that its own work would be structured to contribute to the work of the Commission,

Also recalling that, in the multi-year programme of work of the Commission on Sustainable Development, the sectoral theme for the eighth session of the Commission, to be held in 2000, is integrated planning and management of land resources and that the economic sector focus will be agriculture,

Noting the inextricable interrelationship between agriculture and water,

Recalling that the Food and Agriculture Organization of the United Nations is the task manager for the implementation of the chapters in Agenda 21[1] relating to land management and agriculture,

Invites the Food and Agriculture Organization of the United Nations to prepare a background paper for the eighth session of the Commission on Sustainable Development on the interrelationship of agriculture and water; the document should examine the use of water by agriculture, recognizing the scarce and vulnerable nature of water and also recognizing agriculture as one of many users and the primary consumptive use of water on a global basis; the document should also examine the following issues, analyse their importance and recommend actions or alternatives, citing case studies, where possible:

1. Overarching issues

The water crisis and the role of agriculture as water dependent and highly vulnerable to water deficiencies, and also with regard to its impact on both water quality and water quantity;

Conciliation of water availability and agricultural planning within or without transboundary agreements between States to allocate water and guarantee availability;

Extension and promotion of technology and information on water and agriculture;

Demand management;

Integrated approaches to soil and water conservation;

Interrelationship of agriculture and water quality;

Importance of community participation in decisions affecting shared water sources;

Importance of the availability of agro-meteorological, hydrological and hydro-geological data;

Need for a re-evaluation of the concept of food security, taking into account water shortages, and consideration of meeting nutritional needs through trade and crop diversification, taking into account customs and marketing, as appropriate;

Consideration in programme planning, policy and reviews of relevant international conventions, treaties and agreements relating to water management or agriculture, for example, the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities,[2] the Convention on the Law of the Non-navigational Uses of International Watercourses[3] and the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture;[4]

2. Irrigation and drainage

Use of fossil water for crop production and unsustainable use of groundwater, threatening drinking-water supplies;

Agricultural drainage and long-term agricultural yield;

Soil and aquifer salinization;

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[2] A/51/116, annex II.

[3] General Assembly resolution 51/229, annex.

[4] *Report of the International Technical Conference on Plant Genetic Resources, Leipzig, Germany, 17–23 June 1996* (Food and Agriculture Organization of the United Nations, 1996), annex 2.

River depletion problems (for example, the Yellow River and the Aral Sea);

Development of environmental guidelines for irrigation and drainage;

3. Rain-fed agriculture

Need to emphasize the non-irrigated sub-optimal producers, who are also the most vulnerable and among the poorest producers;

Need for varieties that are drought tolerant, flood tolerant and more water efficient;

Need to catalogue and disseminate new and traditional water-saving technologies and integrated soil and water conservation techniques;

Need to consider rainwater harvesting techniques and ponds or water-holding areas for dry season agricultural production and for livestock and fish production;

Soil and water conservation;

Importance of soil and water conservation techniques, including contour ploughing, conservation tillage and buffer strips;

Type of soil, crop and water quality has to be considered in relation to the availability of land and water resources;

Promotion of riparian buffers;

Protection of wetlands;

Use of an ecosystem approach to development and planning;

Control of chemical pollution;

Promotion of integrated pest and integrated nutrient management systems;

Encouragement of organic food production;

Monitoring of groundwater and surface water for nutrient loads and pesticides (for example, nitrate contamination of groundwater in Europe and persistent problems from pesticide misuse in El Salvador);

Opportunities for organic production.

In addition, the Food and Agriculture Organization of the United Nations should include consideration of water in all of its preparations and discussions for the preparatory meeting that it is co-sponsoring with the Government of the Netherlands.

Draft resolution III

Report of the Secretary-General on issues related to the spatial planning of land (including minerals) and water resources

The Economic and Social Council:

1. *Takes note with appreciation* of the report of the Secretary-General on issues related to the spatial planning of land (including minerals) and water resources;[5]

2. *Requests* the Secretary-General to prepare a report based on the above-mentioned report and taking into account the suggested revisions contained in the annex to the present resolution, and to make it available to the Commission on Sustainable Development at its eighth session as a background document on integrated land management.

[5] E/C.7/1998/5.

Annex

Suggested revisions to the report of the Secretary-General on issues related to the spatial planning of land (including minerals) and water resources (E/C.7/1998/5)

I. Introduction

A paragraph should be added to address the concerns expressed in the inter-sessional strategy paper of the Committee on Natural Resources,[6] about the serious implications for society as a whole and the life-support systems on which it is based if the looming water crisis with its four basic components — water quality, water quantity, urbanization and land degradation — is allowed to develop into a full-scale crisis. Such a crisis, owing to the close interrelationship between fresh water and land use, would be felt in many different societal sectors, including human health, food security, economic production and biological diversity.

A summary of the recommendations of major international meetings on the integration of land and water management, such as those held at Mar del Plata, Dublin and Rio de Janeiro, should be included.

II. Current and emerging management issues

References to the finite nature of water and the water crisis should be included to balance paragraphs 7 to 9 on land limitations.

Land-use planning and development need to take into consideration the finite nature of water and apportion projected needs in a coherent manner; this should be discussed.

A reference to forest resources should be included.

In paragraph 7, the following could be considered: Forests in the main help to provide a balance between life-support systems within the ecosystem. Deforestation tilts this balance and exposes the ecosystem to ever-increasing degradation. The role of forestry in land use and in land management techniques should therefore not be underestimated. The interdependency of forestry and agriculture in the lives of rural people is now becoming an issue which Governments must resolve in an integrated manner.

In paragraph 9, a stronger reference to the misuse of agricultural chemicals should be considered.

Between paragraphs 10 and 11, the following text should be inserted:

> The allocation of scarce water resources among competing uses has fundamental effects on human welfare, socio-economic development and the protection of ecosystems. The provision of adequate amounts of water for basic human needs should be incorporated into the formulation and implementation of policies for water resource development and allocation. In this context, the equitable and sustainable allocation of water resources is an essential element of rural and urban development strategies aimed at poverty alleviation through generation of employment, income and productivity. Such strategies should be based as much as possible upon community participation at the lowest appropriate levels, taking into particular account the role of women in rural and urban communities as ultimate managers of water resources in both household and agricultural use. Such approaches require specific policies to improve local institutional capacity and promote human resources development.

[6] E/C.7/1996/6 and Corr.1, paras. 13–30.

Economic evaluations need to consider positive and negative impacts on both human and ecosystem health. To the extent that subsidies are required to maintain public health and equitable access, they should be clearly targeted to the intended beneficiaries and aligned with rural development strategies. Additional funding, targeted mainly to peri-urban and rural areas, may also be required to implement such strategies. The integration of water resources development and management with land-use planning is also essential to promote stabilization of rural populations through the alleviation of rural poverty and promotion of local employment opportunities in the productive use of water and land.

III. Actions to improve and enhance the spatial planning of land and water resources

A paragraph should be added to address the following concern:

While water moves through the landscape from the watershed to the mouth of the river according to natural laws, climate and topography, the societal sectors in the river basin depend on access to water and at the same time influence the quality and quantity of the water accessible to those downstream. As stressed by the Harare expert group, integrated water resource management is therefore essential for integrating and reconciling interests in the river basin — whether national or international — with regard to water quality, quantity and the aquatic ecosystems. A constructive dialogue needs to be made possible at the basin level to develop consensus between land and water users and stakeholders. Strategies should be specific about methods of pollution avoidance to ensure sequential water use downstream. The integration between management and use of land and water and waste management should be reflected in the approach to human health, nutrition, employment, poverty alleviation and ecosystem integrity.

A. Integration of land and water resources management into national socio-economic strategies

The inclusion of an additional box on the Murray-Darling basin land and water management initiative in Australia is recommended.

Greater attention should be paid, possibly in an additional paragraph, to grass-roots participatory approaches and gender issues in this section.

B. Land, water and food security

The concept of food security needs to be re-evaluated to take into account water shortages and to focus on the meeting of nutritional needs through crop diversification and trade, as appropriate; the concept of long-term sustainability of the food production system should incorporate soil and water conservation, not focus on production level only.

Traditional practices relating to agriculture need to be acknowledged and appropriately addressed.

Extension services to facilitate the adoption of water-saving practices in agriculture need to be strengthened.

Small-scale irrigation efforts (for example, groundwater) need to be reviewed.

C. Land, water and health

The need for measures to encourage sustainable approaches to agricultural production, including organic agriculture, should be discussed.

An analysis of the contamination of land and water by harmful trace elements and heavy metals, such as mercury used for the amalgamation of gold in artisanal and small-scale mining, should be included.

Up-to-date information about health risks posed by contaminated land and water resources should be provided.

The disposal of solid, liquid and toxic wastes and their impacts on basin hydrology should be considered.

D. Protection of land and water ecosystems

The first half of the paragraph should be retained. The relationship between land and water development and its implications for the ecosystem may be summarized as discussed in paragraphs 60 to 66 of the report of the Harare expert group.

The paragraph could be divided into two paragraphs, one focusing on international agreements (several more need to be added, including the United Nations Framework Convention on Climate Change,[7] the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa,[8] and the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities,[2] and one dealing with an evolution of the potential need for policy and institutional re-evaluation in the light of treaty obligations.

International cooperation needs to be evaluated in the cases of shared watercourses, and cooperation between upstream and downstream countries needs to be encouraged; the Convention on the Law of the Non-Navigational Uses of International Watercourses[3] merits analysis in view of its relevance to land use as well as to access to water and sanitation and environmental questions; successful cooperation examples, such as the Zambezi River Authority, might be considered.

E. Information management and monitoring systems

Hydrological and hydrogeological information needs to be made available between neighbouring countries in the same manner that meteorological information is made available through the World Meteorological Organization.

Hydrologic, meteorologic and hydrogeologic data need to be accessible to the public on a timely basis, especially for flood and drought management.

F. Institutional and legal framework and capacity-building

The section could be divided, placing paragraphs 32 to 34 in a section on capacity-building and paragraph 35 in a section on gender.

The different strategies for local participation and basin-wide integration need to be clarified in paragraphs 27 and 28.

The potential for local participation in the construction, operation, maintenance and management of waterworks should be evaluated.

Paragraph 30 is a general paragraph, and any specific reference to water, soil or minerals is unhelpful and should therefore be deleted.

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[7] A/AC.237/18(Part II)/Add.1 and Corr.1, annex I.

[8] A/49/84/Add.2, annex, appendix II.

In paragraph 31, the channelling of financial resources through basin management organizations should be examined.

Economic analysis of national and international river basin management should be encouraged.

H. Mobilization of financial resources

The importance of streamlining regulatory and institutional structures and making them transparent so as to mobilize all available resources needs to be evaluated.

In paragraph 38, after the words "Developing countries", the words "and countries with economies in transition" should be added.

B. Draft decisions for adoption by the Council

2. The Committee on Energy and Natural Resources for Development recommends to the Economic and Social Council the adoption of the following draft decisions:

Draft decision I

Second session of the Committee on Energy and Natural Resources for Development

The Economic and Social Council decides:

(a) That the dates of the second session of the Committee on Energy and Natural Resources for Development shall be brought forward to 14 to 25 August 2000;

(b) That provisions shall be made for the Committee's two Sub-groups (on Energy and on Water Resources) to hold parallel meetings.

Draft decision II

Report of the Committee on Energy and Natural Resources for Development on its first session and provisional agenda and documentation for the second session of the Committee

The Economic and Social Council:

(a) Takes note of the report of the Committee on Energy and Natural Resources for Development on its first session;

(b) Decides to transmit the report of the Committee to the Commission on Sustainable Development;

(c) Approves the provisional agenda and documentation for the second session of the Committee set out below:

Provisional agenda and documentation for the second session of the Committee on Energy and Natural Resources for Development

1. Election of officers.
2. Adoption of the agenda and other organizational matters.
3. Review of the reports of the Secretary-General to be prepared for the eighth session of the Commission on Sustainable Development dealing with the issues of integrated planning and the management of land and water resources.

Documentation

Report of the Secretary-General on progress made in providing safe water supply and sanitation for all during the 1990s

Report of the Secretary-General on issues related to the spatial planning of land (including minerals) and water resources (revised in accordance with the guidelines contained in Economic and Social Council resolution 1999/_____) (see chap. I, Sect. A, draft resolution III)

4. Outcome of the seventh and eighth sessions of the Commission on Sustainable Development.

Documentation

Oral report

5. Strengthening and coordination of the activities of the United Nations system in the field of water resources.

Documentation

Report of the Secretary-General on technical cooperation activities in the field of water resources development

6. Key issues related to the integrated planning and management of land use, ecosystems and freshwater development, use and protection, with special emphasis on the impact of the quantity and quality of shared waters of riparian States.

Documentation

Documentation to be provided by the Committee members to the Secretariat

7. Follow-up to the first session of the Committee.

Documentation

Report of the Secretary-General

8. Contribution to the ninth session of the Commission on Sustainable Development and its preparatory process.

9. World energy assessment report: its implication for sustainable energy policy development.

10. Review of salient trends and issues on energy development and use in the context of sustainable development:

(a) Energy and the residential sector;

Documentation

Report of the Secretary-General

(b) Renewable sources of energy, with special emphasis on solar energy;

Documentation

Report of the Secretary-General

(c) New financial mechanisms and economic instruments to speed up the investment in sustainable energy development;

Documentation

Report of the Secretary-General

(d) Promising strategies and initiatives to accelerate the development and implementation of sustainable energy technologies;

Documentation

Report of the Secretary-General

(e) Coordination of energy activities within the United Nations system.

Documentation

Report of the Secretary-General

11. The multipurpose use of hydro resources (for joint consideration by the two Sub-groups).

Documentation

Report of the Secretary-General

12. Provisional agenda for the third session of the Committee.

13. Adoption of the report of the Committee on its second session.

C. Decisions of the Committee brought to the attention of the Council

3. The following decisions, adopted by the Committee, are brought to the attention of the Council:

Decision 1/1. Contribution to the preparatory process for the ninth session of the Commission on Sustainable Development

The Committee on Energy and Natural Resources for Development decides to submit to the ninth session of the Commission on Sustainable Development, in accordance with the provisions of Economic and Social Council resolution 1998/46, the contribution to the preparatory process of the Commission which is contained in the annex to the present decision.

Annex

Contribution to the preparatory process for the ninth session of the Commission on Sustainable Development

I. Introduction

1. In its resolution 1998/47, the Economic and Social Council called for a special relationship between the work programme of the Committee on Energy and Natural Resources for Development and that of the Commission on Sustainable Development, so that in formulating its programme of work the Committee should take into full account the multi-year work programme of the Commission so as to ensure that its own work programme will be structured in a manner that could enable it to contribute to the work of the Commission.

2. In connection with the energy sector, in the multi-year work programme of the Commission adopted by the General Assembly at its nineteenth special session, the sectoral theme of the ninth session of the Commission in 2001 will be "Atmosphere/energy", while in the economic sector, "Energy/transport" will be deliberated upon. The Assembly also stated that in line with the objectives of Agenda 21, the ninth session of the Commission should contribute to a sustainable energy future for all.

3. Thus, the Committee at its first session has taken the initiative to usefully contribute to the preparatory process for the ninth session of the Commission at the very initial stage. In its discussions, the Committee considered the pending issues pertaining to a sustainable energy future, and identified the seven most critical issues that require urgent attention during the preparatory process, particularly by the Open-ended Intergovernmental Group of Experts on Energy and Sustainable Development and by the Commission.

4. The Committee also discussed the different options for a sustainable energy future, and identified six options that should have special attention. Moreover, the Committee also considered different policies and measures that should be implemented to achieve a sustainable energy future.

5. The recommendations of the Committee concerning the preparatory process for and the outcomes of the ninth session of the Commission are set out in section II below. The recommendations are further elaborated in sections III through VII below.

II. Recommendations concerning the outcomes and the preparatory process for the ninth session of the Commission

6. The Committee on Energy and Natural Resources for Development makes the following recommendations concerning the outcomes of the ninth session of the Commission on Sustainable Development:

A

1. The Commission may aim to create better understanding on and approaches to energy and sustainable development issues for the next century.
2. The Commission may wish to express its recognition of outstanding development issues and constraints related to sustainable energy development, which should facilitate sustainable energy policies to be formulated and implemented, especially at the national level within a regional context.
3. The Commission may initiate a mechanism to constitute progressively a set of common principles which would be commonly accepted as recommendations on best practices for paving the way to a sustainable energy future.

B

More specifically the Commission may wish to address:

1. Ways and means to improve the access to energy, especially in rural and urbanizing areas and to achieve the security of energy supplies and energy market developments;
2. Options and measures to achieve a transformation of energy systems in a sustainable way, such that within appropriate time-frames atmospheric emissions related to the production and consumption of energy, including greenhouse gas emissions, are greatly reduced;
3. Promising strategies and initiatives to accelerate the development and implementation of sustainable energy technologies;
4. New approaches and technologies to radically improved performance of the transportation sector, both in terms of energy consumption and environmental emissions;

5. Conditions under which liberalization and privatization of the energy sector can fully contribute to a sustainable development of the energy system, especially in developing countries;

6. Ways and means to overcome the difficulties in mobilizing the available financial resources to increase the volume of investment in the development and realization of sustainable energy systems;

7. Ways and means to support the development and enable the implementation of national sustainable energy policies and action programmes, including sustainable rural energy development programmes.

C

In addition, the Commission may wish to identify and promote, especially at the international level, specific actions in the area of:

1. Improving the efficiency of the production and use of energy and materials;

2. Speeding up the development and use of renewable energy technologies;

3. Cleaner production and use of fossil fuels;

4. Assessing the potential role of nuclear power in a sustainable energy future, in full consultation with and participation of the parties concerned;

5. The development and implementation of cleaner alternative fuels and new technologies for the transportation sector;

6. Extension and interconnection of the energy transportation grids.

D

Finally, the Commission may wish to encourage:

1. Regional initiatives to address the issues and options to be critical in achieving a sustainable energy future;

2. Systematic evaluation and dissemination of information concerning the effectiveness of United Nations programmes in the field of energy;

3. Strengthening of the cooperation and coordination on energy issues within the United Nations system through an appropriate mechanism, based on the present arrangements for inter-agency coordination and cooperation in the field of energy at the global, regional and field levels.

7. The Committee on Energy and Natural Resources for Development recommends the timely creation of a bureau of the Open-ended Intergovernmental Group of Experts on Energy and Sustainable Development so that the preparatory work for this Expert Group can be initialized soon after the seventh session of the Commission. To facilitate the work of the Bureau, adequate support should be made available.

8. It also recommends that the activities of the Group of Experts, as well as the ad hoc inter-sessional working groups for the ninth session of the Commission, be organized taking into account the recommendations of the Committee concerning the outcomes of the session.

9. The Committee has taken note with appreciation of the initiative of the Department of Economic and Social Affairs, the United Nations Development Programme and the World Energy Council to prepare a world energy assessment, based on inputs from leading experts as well as a review and consultation of a number of stakeholders, as a contribution to the preparatory process and the discussions of the ninth session of the Commission.

10. The Committee suggests that substantive contributions along the lines indicated in this report could be prepared by the entities of the United Nations system, if possible in cooperation with parties concerned.

11. The Committee members, individually or as a group, are willing to contribute to the preparatory process, where possible, *inter alia*, by giving advice to the Chair of the Group of Experts, by providing support to the work of the bureau of the Expert Group and preparing documents on some of the critical issues. In addition, Committee members are willing to play a role in the review of the world energy assessment.

12. To allow a proper contribution of the Committee to the ninth session of the Commission, as well as to its preparatory process, the Committee will request the Economic and Social Council to authorize its second session, scheduled to be held in 2001, to be brought forward to August 2000. Among the items to be considered at that session are:

(a) Contribution to the ninth session of the Commission on Sustainable Development and its preparatory process;

(b) World energy assessment report: its implication for sustainable energy policy development;

(c) Review of salient trends and issues on energy development and use in the context of sustainable development, including:

(i) New financial and economic mechanisms to speed up the investment in sustainable energy development;

(ii) Promising strategies and initiatives to accelerate the development and implementation of sustainable energy technologies.

III. Critical role of energy in sustainable development

13. Energy plays a key role in achieving the interrelated economic, social and environmental objectives that lead to sustainable development. Energy facilitates all human endeavour and is essential to life. Rapid increases in the delivery of energy services will be required to facilitate the development of income-generating opportunities and improve living standards, particularly in developing countries and in their rural and urbanizing areas. Increased energy services will also be required to meet the demands of population growth and its dynamics: poverty alleviation, urbanization, improved health and education services. Modern industrial economies are heavily dependent on energy, and further growth of these economies will result in increased needs for energy services. While the development and use of energy give rise to environmental degradation through the production of waste material and emission of pollutants, energy plays an important role in the protection of the environment, including the reduction of adverse environmental impacts.

14. Accelerated development and application of environmentally sound technologies to fulfil the need for energy services of present and future generations will play a critical role in the sustainable development of the society. Energy strategies toward such a development at the national, regional and global levels should focus on the objectives that have to be achieved on longer terms, but these strategies should be in harmony with short-term requirements for sustainable development.

IV. Critical issues

15. The Committee indicates the following issues to be critical in achieving a sustainable energy future:

(a) Accessibility of energy;

(b) Energy and atmospheric emissions;

(c) Sustainable energy technology development;

(d) Energy and transportation;

(e) The impact of liberalization and privatization;

(f) Adequate financing;

(g) Formulation and implementation of sustainable energy policies.

A. Accessibility of energy

16. The availability of sufficient energy at affordable costs is vitally important if the objective of sustainable development is to be achieved. To be sure, global conventional energy resources are adequate to meet the projected growth in energy services for decades to come, provided that technology is developed to exploit and utilize these resources in an efficient manner; the total energy resource base is expected to be expanded by the development and application of renewable sources.

17. However, from a national and to some extent regional point of view, issues of great concern which require attention are those of accessibility of energy resources and security of supply, given the uneven distribution of these resources, inadequacy of technology to harness resources at affordable cost and in an environmentally sound manner, lack of adequate policies, inadequate awareness on the potential of some of these resources, inadequate investment for the development and use of the resources and lack of infrastructures. Ways and means should, therefore, be found to address the above issues and thereby lead to the improvement of access to energy resources and to stimulate the security of market development and supplies, so that the demand for energy services can be met in a reliable way, especially in developing countries, including rural and urban areas.

B. Energy and atmospheric emissions

18. Combustion of fossil fuels and unsustainable use of biomass sources cause extensive local and regional air pollution. The extraction, conversion and combustion of fossil fuels lead, among others, to increasing concentrations of greenhouse gases (GHG) in the atmosphere, altering the radiative balance of the atmosphere, possibly causing climate change. Consequently, temperatures on earth may change, sea levels may rise, ecosystems may be threatened and food production may be severely affected. Therefore, the mitigation of greenhouse gas emissions, apart from other emissions, must be accorded the highest consideration by the global community.

19. It is well understood that stabilizing the concentrations of greenhouse gases below dangerous levels requires on longer terms a reduction of man-made greenhouse gas emissions far below present levels. This, in turn, can only be brought about by a transformation of energy systems, such that emission of GHGs is greatly reduced. A successful implementation of the Kyoto Protocol[9] to the United Nations Framework Convention on Climate Change would create a first step.

C. Sustainable energy technology development

20. It must be recognized that a transition towards sustainable energy systems requires more than just marginal adjustments or the replacement of a certain energy technology. It requires the development of new approaches of technological options at various levels in

[9] See FCCP/CP/1997/7/Add.1.

all sectors of society. It also requires the development of new and advanced energy technologies that can contribute to a sustainable future. New strategies and initiatives to accelerate the development and implementation of environmentally sound energy technologies are needed, taking into account such aspects as equitable access to technologies, the optimum scale of technologies, the (potential) competitiveness of technologies, the external costs of technologies, the lead time of a technology from development to a viable application, public acceptance and the attitude of stakeholders toward the technologies.

21. It should be noted that a strategy towards sustainability does not exclude a priori any development or use of an energy resource or technology. To increase the security and flexibility of supply, one might even conclude that we should develop as many options as we can afford. However, it should also be clear that the development of an option should be compatible with the pursuit of sustainability. This requires a further development of sustainability indicators to allow the evaluation of different technological options as well as, for each energy option, the formulation of sustainability standards.

D. Energy and transportation

22. The transportation sector has been the major source of growth for oil demand over the past 25 years. It is one of the fastest growing energy consuming sectors in the world, especially in developing countries, where the annual average growth rate during the past 25 years has been about 5 per cent. The global transportation system relies nearly completely on petroleum-based fuels, accounting for almost 60 per cent of final world oil consumption. Alternative fuel vehicles remain a small fraction of the total world vehicle stock.

23. Environmental impacts of transportation continue to be very large. It accounts for a substantial share of emissions of gaseous pollutants, particularly greenhouse gases, and particulate matter. Concern over air quality and GHG-induced global warming has led to actions to reduce some environmental impacts, with positive effects in, for example, urban areas. However, some emissions from transportation have increased, mainly carbon dioxide.

24. New technologies and approaches are developed to improve the performance of the transportation sector, both in terms of energy consumption as well as environmental emissions. These include new transportation schemes, far more efficient energy conversion technologies, near-zero emission technologies and the production and use of alternative fuels. Attention should be given to the potential of these options and to policies and measures to speed up their development and application.

E. Impact of liberalization and privatization

25. Regulatory reform, liberalization and privatization are high on the agenda of the energy sector. The aim of the reform is to improve economic performance by facilitating competition and increasing economic efficiency. The strong expectation is that liberalization, above all in the field of electricity and gas, will yield important short-term and long-term benefits for the economy and the consumer.

26. Reforms can also have risks; therefore, they should be introduced diligently and must incorporate appropriate regulatory framework.[10] One area of risk is security of supply for the consumer. Secured supply can be achieved in a gradually liberalized market provided there is competition among suppliers, otherwise appropriate government measures must be taken. Another area of risk is the environment. New regulation and market-based

[10] See International Chamber of Commerce, "Liberalization and privatization of the energy sector", ICC publication 607/2 (Paris, December 1998).

instruments are needed to deal with environmental preferences of society. One option is energy pricing that better reflect the economic and environmental costs. Other options are, *inter alia*, green certificates and tradeable permits. Also, the impact of reforms on the development and implementation of advanced technologies, such as clean fossil fuel technologies and renewables, is a matter of concern. New regulation, like the Non-Fossil Fuel Obligation (NFFO) in the United Kingdom, seems required to assure the necessary innovation in the energy field.

27. It is recommended to investigate how and under what conditions, the liberalization and privatization of the energy sector can contribute fully to a sustainable development of the energy system. Special attention should be given to the requirements of the regulatory framework under which these reforms must take place. Particular attention should be given to the impact of liberalization and privatization on tackling the energy and development issues of developing countries, especially in rural areas and areas of urbanization.

F. Adequate financing

28. Investment in the energy sector accounts for 15–20 per cent of all fixed capital investment in the world economy. A shift to renewables and other sustainable energy technologies will often but not always lead to higher specific capital costs compared to conventional fossil energy supplies and therefore to increased investment need. Meeting energy investment needs is particularly a problem in developing countries. One reason is that Governments and multilateral agencies have become financially constrained. More important, however, is that in many cases the political, legal and institutional structures necessary to underpin conventional investments are weakly developed or non-existent.

29. It is suggested that the core issue is not a lack of financial resources but the difficulties in mobilizing the financial resources available. To solve this problem, many countries need support to design structures and mechanisms for reducing investment risk and arranging funding. The problems in matching the different goals of Governments and investors are not inconsiderable, and as a result many worthwhile projects never take place and people remain without commercial energy services. It is essential that investment agencies exist within an adequate legal framework which have clear authority, are accountable for results and operate transparently. Further investigation of the financial problems and the suggested solutions is strongly recommended, in particular concerning the question of acceptable temporary and/or social subsidies. In addition, attention is needed for the development of new mechanisms to increase the volume of investment in the application of sustainable energy technologies, especially energy efficiency and renewable energy technologies. It is important to bring programmes for the realization of sustainable energy systems to the attention of relevant funding and technical assistance sources and to encourage them to consider contributing to the effective implementation of those programmes.

G. Formulation and implementation of sustainable energy policies

30. New policies are needed to promote energy strategies compatible with the objectives of sustainable development set forth in major United Nations conferences and conventions. Especially, the formulation, adoption and implementation of national sustainable energy policies and national action programmes, as well as self-reliant rural energy development programmes (see Agenda 21, para. 14.94) are urgently needed. Energy policies for sustainable development should have the following core objectives:

(a) To ensure stable, adequate and efficient supplies and equitable access to energy services;

(b) To promote energy efficiency and energy conservation;

(c) To minimize adverse environmental effect of energy production and consumption;

(d) To accelerate the development and use of energy resources and technologies compatible with the pursuit of sustainability.

These objectives can be achieved by creating an enabling environment that encourages broad participation of stakeholders, especially the private sector. Realizing such an enabling environment often requires the promotion of indigenous capacity-building, the establishment of appropriate institutional arrangements, including the promotion of public services, and the creation of an appropriate regulatory framework conducive to new investments.

31. The long-term energy demand in major consuming sectors (urbanization and habitat, transport, industrial and the energy sector itself) is determined by the type of infrastructures chosen in those sectors. These infrastructures have an inherent long-term rigidity (40–50 years), which should be taken into account in formulating a sustainable energy strategy; this would in turn involve choices and decisions in the short term on infrastructures, in line with a sustainable energy path.

32. The implementation of policies that have been developed is a critical point of each development plan. A major problem is that many countries have formulated energy policies and action plans but lack the capacity or political will to implement them. This can have many reasons, ranging from weak policy implementation institutions, existing subsidy systems or lack of public awareness to unavailability of financial resources and lack of technical know-how. It is recommended to assess, as part of the preparatory process for the ninth session of the Commission, the formulation and implementation of sustainable energy policies compatible with the outcomes of major United Nations conferences and conventions, based on inputs from member States and from different stakeholders. Special attention should be given to the development and implementation of rural energy programmes.

V. Options for sustainable energy futures

33. The Committee identified the following options that should have special attention to achieve a sustainable energy future:

(a) Improving energy and materials efficiency;

(b) Speeding up development and use of renewable energy technologies;

(c) Cleaner production and use of fossil fuels;

(d) Role of nuclear power in sustainable energy future;

(e) Cleaner alternative fuels and new technologies for the transportation sector;

(f) Extension and interconnection of energy transportation grids.

A. Improving energy and materials efficiency

34. Already in 1987, the World Commission on Environment and Development concluded that the best route to sustainable development of the energy system is a "low energy path", which means that nations should take the opportunities to produce the same levels of energy services with as little as half the primary energy currently consumed. Considerable energy savings have been achieved in recent decades. Three factors have played a major role in this development: increasing energy prices from the early 1970s to the mid-1980s, technology development and energy policies aimed at bringing energy efficiency into the market.

35. Also at present, large gains in energy efficiency can still be achieved with commercially available technologies in all sectors of society. There is no doubt that developing countries which need to increase their energy consumption to achieve development goals will reach higher levels of sustainability by applying these technologies from the start. Moreover, continuing gains are feasible with advanced technologies for a long time to come. Ultimately, an efficiency improvement in energy conversion and use, of 50 to 90 per cent, depending on the sector involved, seems feasible. To analyse opportunities to the year 2020, a scenario approach can be followed, as presented in a study prepared by the Secretary-General.[11] In this study it is estimated that under business-as-usual conditions till the year 2020, global energy consumption will grow at an average rate of 2.0 per cent per year. Adoption of today's state-of-the-art technology in all sectors by the year 2020 would reduce the growth rates of energy consumption to 1.3 per cent per year. Energy policies that lead to accelerated development and implementation of new energy-efficient technologies can limit the growth of energy use even to 0.6 per cent per year. Increased material efficiency improvement measures may decrease the growth rate of energy consumption further to 0.2 per cent per year.

36. Material production accounts for about one quarter of total global energy consumption. At several stages in the material life cycle, intervention through proper management can increase the material efficiency over the total cycle, in such ways as good housekeeping, material-efficient product design, material substitution, product reuse, material recycling and quality cascading. These programmes can lead to substantial energy savings and strongly reduced waste production.

37. Accordingly, if a more balanced energy investment strategy is instituted, resulting in increased investment in energy and material efficiency and reduced investment in energy supply, both developing and industrial countries could save significant amounts of capital without sacrificing energy services. However, in current energy policies, energy efficiency does not receive the attention required, given the role it needs to play in the development of a sustainable energy future. Regulatory frameworks typically do not stimulate energy-saving measures. A balanced approach is needed to place supply and demand of energy on equal footing. Radical changes are needed to fulfil the promise of energy efficiency and to make energy and material needs more sustainable.

B. Speeding up development and use of renewable energy technologies

38. The contribution of commercial and non-commercial renewable sources of energy, at present, is estimated at about 18 per cent of total world energy consumption. On an individual country basis, the contribution of these sources is much more important in developing countries, especially in rural areas. Large hydropower and traditional biomass are by far the most important among the currently used renewable sources of energy. The truly new and emerging energy technologies for the development and use of mini-hydro, geothermal, solar, wind and modern processing of biomass, contribute less than 2 per cent of the world total energy demand.

39. Available projections or scenarios of the future of the renewables indicate that they could potentially contribute economically more than half the present commercial world energy consumption by the year 2050 or thereafter. Speeding up the development and use of renewable technologies will help in solving the critical issue of inadequate supply and availability of primary energy sources in different areas. Moreover, it will have a substantial

[11] See Worrell et al, "Potentials and policy implications of energy and material efficiency improvement" (New York, United Nations, 1997).

impact on solving the problem of environmental emissions. However, such a rapid development of renewable sources of energy will require that an array of policy changes and practices be mobilized in the short term by Governments, business and multilateral organizations active in the energy field.

40. Further efforts at the local, national and international levels should be undertaken to obtain quantitative and qualitative information on the availability of renewable sources of energy by adequate mapping of these resources. Also, further dissemination of information to consumers and policy makers about the successful use of technologies to utilize renewable energy sources is needed. For rural areas not connected to grids, sustained programmes of investment in decentralized rural energy schemes, based on an efficient use of renewable energy sources, where reasonable, should be launched, with the incremental cost of such schemes to be met, where necessary from regional and global sources, to meet local demands for energy services.

41. At the national level, there is a need to introduce target objectives for the introduction of renewable energy technologies in the major energy-consuming sectors (housing, agriculture, transport and industry) and to stimulate the development and market introduction of such technologies by raising awareness and education of consumers. Programmes and projects to develop and implement renewable energy technologies, disseminate information and provide training about successful programmes in other regions may be suitable for funding by regional and international organizations.

42. Key elements of a policy aimed at promoting the use of renewable energy sources may well include many of the following:[12] establishment of rational pricing in the energy sector; a well-designed incentive mechanism; provision of stable markets for energy carriers produced by renewable energy technologies; provision of stable renewable energy technology markets; alignment of energy projects' financial performance with society's environmental goals; enhancement of community participation in project planning and in reaping project benefits; encouragement of decentralized projects in remote communities; removal of institutional barriers to renewable energy technologies; and encouragement of research and development.

43. Lessons should be learned from a number of successful projects in a range of countries in order to develop and implement renewable energy technologies and to create jobs, income and social development based on the production and use of these technologies. Valuable recommendations for the speeding up of the development and deployment of renewable energy technologies, applicable at both the national and international levels, are contained in the World Solar Programme 1996–2005.[13]

C. Cleaner production and use of fossil fuels

44. Most global energy needs today are provided by fossil fuels. It is expected that these fuels will continue to play a major role in the energy supply for many decades to come. The growing energy requirements, particularly of developing countries, make it necessary to use finite resources sparingly in the interest of future generations. Current practices of production, distribution and use of fossil fuels threaten the assimilation capacity of the environment at the local, regional and global scales. It results in the emission of particulates, acid components and greenhouse gases, which can have severe impact on health, food production, nature and the climate system. Thus, there is a clear need to increase the efficiency of fossil energy use, improve the environmental compatibility of fossil

[12] See E/C.13/1998/4.

[13] A/53/395, annex.

technologies and shift to low-carbon fossil fuels, such as natural gas. This requires the development and implementation of advanced technologies that are characterized by near-zero local and regional pollutant emissions and lower costs in meeting environmental objectives.

45. Special attention should be given to decarbonization technologies that allow the use of fossil fuels with strongly reduced carbon dioxide (CO_2) emissions. One option is the production of hydrogen from fossil fuels combined with storage of the by-product CO_2. Another option is the removal of CO_2 from fossil fuel power plants. CO_2 recovery can also be achieved from large-scale industrial processes, such as the manufacturing of hydrogen in refineries and the production of ammonia from natural gas. Finally, the capture and sequestration of CO_2 from fossil fuel recovery processes is an interesting option, which is currently being demonstrated in Norway. The potential to utilize the recovered CO_2 is interesting but quite limited. Therefore, most of the CO_2 must be sequestered underground — in deep saline aquifers, depleted natural gas fields or deep coal beds — or in the deep ocean. This should be achieved in a safe and acceptable manner. Research, development and demonstration is required to improve the performance of CO_2 removal and sequestration technologies and to allow their further integration in the sustainable development of energy systems. Given the requirements for mitigation of GHGs, particularly CO_2, by the United Nations Framework Convention on Climate Change,[14] the potential of de-carbonization should receive added attention as it is the only greenhouse gas mitigation option that may allow for a longer-term large-scale use of fossil fuels.

D. Role of nuclear power in sustainable energy future

46. At present, nuclear power accounts for about 16 per cent of world total electricity generation. This is equivalent to about 5 per cent of commercial energy consumption worldwide. Nuclear energy could replace base load fossil fuel electricity generation in many parts of the world. In this way, it could contribute to curbing the CO_2 emissions. It is necessary, however, that acceptable responses can be found to such concerns as reactor safety, radioactive waste management, proliferation of fissile material and life cycle cost. This most probably requires the development of new technologies and safety regimes.

47. The Committee recommends investigating under what conditions nuclear technology can play a substantial role in a sustainable energy future, in full consultation with and participation of the parties concerned. Also, it is recommended to evaluate options and technologies that can be developed and implemented to fulfil these conditions. Special attention should be given to technologies that allow inherent safety. Apart from fission technologies, attention should be given to the (limited?) prospects of fusion technology for the next century.

E. Cleaner alternative fuels and new technologies for the transportation sector

48. The rapidly growing global consumption in the transport sector, especially in the developing countries, together with increasing concerns about the environmental impacts of petroleum combustion emissions, have stimulated research and development into cleaner fuels and new transportation technologies.

49. Cleaner transportation fuels that have attracted the most interest and are actively being tested and developed are natural gas, electricity, liquefied petroleum gas, methanol, ethanol, rape seed oil methyl ester, and hydrogen. To achieve wide use, it is critical that the characteristics of cleaner transportation fuels meet important requirements, such as cost,

[14] A/AC.237/18 (Part II)/Add.1 and Corr.1, annex I.

availability, safety and emissions. So far, almost any alternative fuel vehicle technology can serve short-range duty cycles (less than 100 kilometres (km)), while ethanol, methanol and liquefied petroleum gas are for long duty cycles (over 300 km) and compressed natural gas vehicles for a range of about 300 km per day.

50. Increased market penetration of electric vehicles (EVs) will depend on improvements in battery-charging rates, energy densities and power densities and market factors, including cost, consumer preference and response of manufacturers to more stringent regulations for air quality. The limitations in range and durability of batteries in EVs are avoidable with the use of fuel cells. Hydrogen is the ideal fuel for fuel cells, and methanol and natural gas and motor gasoline are also suitable after sufficient processing. Most major automobile manufacturers are moving forward with fuel cell cars. Some use hydrogen gas tanks, while others use liquid methanol and even gasoline. An alliance of a number of leading car manufacturers have set a target of the year 2004 for a commercial automobile fuel cell and drive train system.

51. Among the cleaner transportation fuels, within a near-term horizon, natural gas appears to be the most likely and cost-effective significant alternative to motor gasoline and diesel, particularly for use in fleets, given its abundant resources, its possibilities as a high performance fuel, its clean burning qualities and its convenient commercial availability to end users, especially in the major transportation consumer nations. Attention should be given to the need to reduce the leakage of natural gas because of its impact on climate change.

F. Extension and interconnection of the energy transportation grids

52. The interconnection between national transmission grids on a regional basis in electricity and natural gas should get attention as it represents an efficient means of cooperation between industrialized countries, developing countries and emerging economies. Such cooperation would allow those countries to:

(a) Reduce the capital expenses needed for new investments;

(b) Improve security of energy supply and its diversification;

(c) Promote competition within the liberalized international energy and gas markets;

(d) Support load management actions;

(e) Reduce transmission cost for both electricity and natural gas;

(f) Strengthen technical-economic cooperation in the field of energy;

(g) Promote utilization of natural gas at regional and international levels.

53. For transporting electricity over more than about 700 km, direct current (DC) transmission at high voltage via either overhead lines or underwater cables is less costly and provides less energy losses than alternating current transmission. Therefore, long-distance DC transmission is a feasible option to transport electricity from hydro-generation, wind, solar and biomass sources that are at long distances from demand centres. High utilization of transmission capacity can be realized with intermittent renewable resources when used in conjunction with compressed air or other large-scale energy storage schemes.

VI. Policy and measures for a sustainable energy future

54. In the consideration of policy and measures to achieve a sustainable energy future, issues of crucial importance are:

(a) Development and implementation of national sustainable energy policies;

(b) Regulatory framework for the implementation of energy policies;

(c) Financing and investment, including research and development funding;

(d) Economic instruments to facilitate a sustainable energy future;

(e) Capacity-building;

(f) International cooperation.

A. Development and implementation of national sustainable energy policies

55. The development of energy resources and sustainable energy systems should be consistent with the national objectives of sustainable development aimed at fostering economic and social development for improved living standards of all people. A national sustainable energy policy should:

(a) Be dynamic and informed through collaborative and full participation of the parties concerned;

(b) Fully draw upon resources, expertise and experienced management, where they exist, and continually promote the development of these as well as for energy-related information generation;

(c) Allow for flexibility, including the use of the most effective and desirable mix of energy sources with the least adverse environmental impacts;

(d) Allow available resources to be effectively directed to the most significant problems;

(e) Be aimed at a balance between conflicting objectives, such as competitiveness, security of supply, availability of energy services to rural areas, environmental protection and other public services;

(f) Allow for favourable conditions for promotion and mobilization of financial resources for investment;

(g) Recognize the long lead times involved when developing and implementing a sustainable energy system.

B. Regulatory framework for the implementation of energy policies

56. The establishment of a suitable regulatory framework is an important component of policy and measures for a sustainable energy future. Regulatory policies that rely on performance standards with market-based incentives greatly enhance cost-effectiveness and innovation by encouraging the lowest cost and most innovative compliance strategies. Regulations should be:

(a) Independent and effective, balancing between necessary intervention and freedom of action by the parties concerned;

(b) Suited to the particular needs and requirements for sustainable energy development;

(c) Aimed at objectives sought and not the means of achieving them which is best left to competitive markets and diversity of approach;

(d) Designed to achieve the goals of sustainable energy development in a manner that minimizes costs;

(e) Performance-based, providing maximum flexibility in the means of achieving the goals, but requiring accountability for the results;

(f) Based on the best science and economics, subject to expert and public scrutiny;

(g) Formulated with collaboration and full participation of all stakeholders;

(h) Understandable to those affected by them.

C. Financing and investment, including research and development funding

57. Innovative and new approaches for financing development of sustainable energy, including renewable sources of energy is required and essential — while continuing to pursue efforts to increase official development assistance, ensure continued replenishment of the Global Environmental Facility and encourage domestic and foreign private investments. Furthermore, at the country, regional and international levels, there is a compelling need for mobilizing external financial resources for sustainable energy development. In the meantime, national Governments should create investor-friendly conditions for enhanced capital flows toward development of sustainable energy systems.

58. The inadequate funding for research and development of sustainable energy systems has been noted with great concern, for this has adverse ramifications on the development and application of relevant, viable and environmentally sound energy technologies — at a time when their use could significantly contribute to progress towards a sustainable energy future.

59. It is evident that urgent international attention is required for the mobilization of increased financing of sustainable energy systems and the reactivation and intensification of funding for research and development for such systems.

D. Economic instruments to facilitate a sustainable energy future

60. Economic instruments, such as charges/taxes, subsidies and market creation, can provide flexible, cost-effective and efficient approaches in achieving the goals of development of sustainable energy systems. It can also help to reduce the financial burden for the development and deployment of such systems. Although economic instruments are primarily applied at the national and local levels, they can be adapted in an efficient manner at the regional and international levels. However, economic instruments are not without disruptive effects upon different social and economic groups, and therefore — where appropriate — compensation mechanisms must be put in place. The design and goals of economic instruments must be based on sound science, economic and social considerations and with the full participation of all stakeholders, including major groups, in the debate on the design and implementation of the instruments. Economic instruments should not operate in isolation, and should be applied in conjunction with direct regulation, such as emission charges combined with direct regulation, either to reinforce the regulation or to generate the necessary funds.

61. Economic instruments should facilitate the rational allocation of energy resources and reduce environmental impacts by removing or making more transparent existing energy subsidies; liberalization of energy pricing, including gradual environmental cost internalization; increasing market competition; and addressing environmental liabilities. To accelerate the use of sustainable energy many different types of financial assistance systems can be used, including targeted subsidies.

E. Capacity-building

62. For many developing countries, human, technical and financial resources are still not adequate, imposing severe restraints on their domestic capacity to meet the requirements of developing and using sustainable energy systems. There is a need to strengthen national

capacity, including related institutions. To this end, the international community has a significant role to play. It is thus essential for the international community to renew commitment and support to national efforts for capacity-building in developing countries in this regard to enable them to better formulate and implement policies for sustainable energy development. Special attention should be given to strengthening the ability of developing countries to absorb, adapt and generate sustainable energy technologies. Developed countries and the private sector, in cooperation with relevant international institutions, must strengthen their efforts to effectively share expertise, experience and data on environmentally sound energy technologies.

F. International cooperation

63. There is a need to intensify international cooperation, including South-South cooperation, in order to create an environmentally sound, cost-effective and affordable energy system. It is also essential to ensure international cooperation for promoting energy conservation, improvement of energy efficiency, the use of renewable energy and research and the development and dissemination of innovative energy-related technologies. For the gradual environmental cost internalization to achieve more sustainable use of energy, taking fully into account the economic, social and environmental conditions of all countries, particularly developing countries, the international community should cooperate to help minimize the possible impacts on the development process of developing countries resulting from the implementation of those policies and measures. As noted in other parts of the report, international cooperation is also needed in capacity-building, financing, providing access to information on environmentally sound energy technologies.

VII. Role and responsibility of stakeholders in the development of sustainable energy systems

64. The ability to move in an integrated manner towards a sustainable energy future will depend on building coalitions to identify and articulate desired sustainable energy development objectives and means of achieving these, with essential active participation and better dialogue among all stakeholders. The role and responsibility of stakeholders in the move towards a sustainable energy future, *inter alia*, are:

(a) To bring to bear their experience and expertise as developers and users of energy and related services;

(b) To provide information and generation of heightened public awareness on sustainable energy resources and technologies;

(c) To mobilize financing for sustainable energy development, including research and development for new environmentally sound energy technologies;

(d) Development, acquisition, adaptation and use of environmentally sound energy technologies;

(e) Receptivity of new technologies and willingness to pay the full costs of such technologies.

Decision 1/2. Convening of a meeting on the environmental effects of small-scale and artisanal mining operations

The Committee on Energy and Natural Resources for Development decides to invite the Department of Economic and Social Affairs of the United Nations Secretariat, in cooperation with other organizations of the United Nations system and the mining industry, to consider the possibility of convening a meeting on issues related to the environmental effects of small-scale and artisanal mining operations, including but not limited to pollution of surface water and groundwater.

Chapter II

Items considered by the Sub-group on Energy

A. Contribution to the preparatory process for the ninth session of the Commission on Sustainable Development

1. The Committee considered item 3 of its agenda at the 1st and 2nd meetings of its Sub-group on Energy, on 5 and 7 April 1999, and at its 4th meeting, on 16 April 1999.

2. At the 1st and 2nd meetings of the Sub-group, the Vice-Chairman of the Sub-group, Wilhelmus C. Turkenburg, made statements.

3. At the 2nd meeting of the Sub-group, statements were made by Mr. Devin, Mr. Katsande, Mr. Kahrobaian, Mr. Bravo Trejos, Mr. Pavlovschi, Mr. Boumaour, Mr. Ingimarsson, Mr. Wright, Mr. Derogan, Mr. Meshref and Mr. Zhang.

4. At the same meeting, a statement was made by the representative of the United Nations Educational, Scientific and Cultural Organization (UNESCO).

5. Also at the same meeting, the representative of the Division for Sustainable Development of the United Nations Secretariat made a statement.

Action taken by the Committee

6. At its 4th meeting, on 16 April, the Committee had before it an informal paper entitled "Contribution to the preparatory process for the ninth session of the Commission on Sustainable Development".

7. At the same meeting, the Committee decided to submit the informal paper as a contribution to the preparatory process for the ninth session of the Commission on Sustainable Development, in accordance with the provisions of Economic and Social Council resolution 1998/46 (see chap. I, sect. C, decision 1/1).

8. Before the adoption of the decision, a statement was made by one member of the Committee, who felt that the following paragraph should be included in section V.B of the contribution, after paragraph 43:

> "It should be noted, in this respect, that the World Solar Programme 1996–2005, currently under implementation, contains a series of recommendations for the development and deployment of renewable energy technologies, applicable at both the national and international levels. These recommendations are based upon the commitments made in the Harare Declaration on Solar Energy and Sustainable Development made by the 104 official delegations attending the World Solar Summit (Harare, September 1996). By its resolution 53/7, the General Assembly endorsed the World Solar Programme 1996–2005 as a contribution to the overall sustainable development agenda, and invited all States Members of the United Nations to contribute to its successful implementation".

B. Review of salient trends and issues of energy development and use in the context of sustainable development

9. The Committee considered item 5 of its agenda at the 4th and 5th meetings of the Sub-group on Energy, on 14 April 1999.

10. It had before it the report of the Secretary-General on the follow-up to previous sessions of the Committee on New and Renewable Sources of Energy and on Energy for Development (E/C.13/1998/2).

11. At the 4th meeting of the Sub-group, an introductory statement was made by the representative of the Energy and Transport Branch of the Division for Sustainable Development, after which statements were made by the Vice-Chairman of the Sub-group and by Mr. Devin, Mr. Katsande and Mr. Pavlovschi.

12. At the same meeting, a statement was also made by the representative of UNESCO.

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13. In 1991, the former Committee on New and Renewable Sources of Energy and on Energy for Development, in a draft resolution for adoption by the Economic and Social Council, invited member States, intergovernmental and non-governmental organizations and the private sector to take specific measures with respect to the options for (a) more efficient use of energy and energy intensive materials; (b) increased use of new and renewable sources of energy; (c) more efficient production and use of fossil fuels; and (d) fuel substitution from high to low carbon or no carbon fuels. It also requested the Secretary-General and the United Nations system to adopt all the necessary ways and means to promote the development of a world energy system compatible with sustainable development and in that context to take specific initiatives. The former Committee furthermore recommended that the Secretary-General, *inter alia*, coordinate the exchange of information and experience on research, development and application of renewable technologies; improve the exchange of information on energy activities within the United Nations system; improve the coordination of energy programmes within the United Nations system at the stage of programme budget formulation, make full use of regional commissions in those coordination efforts and promote the extension of coordination of energy activities outside the United Nations system.

14. The former Committee also requested the Economic and Social Council to convene a special session in order to provide advice on energy for rural development to the Commission on Sustainable Development during its session in April 1995, when it was to consider chapter 14 of Agenda 21[15] (Promoting sustainable agriculture and rural development). In the report on each special session, which had been approved by the Council, the former Committee requested the Commission on Sustainable Development to invite all States, entities within the United Nations system and other intergovernmental organizations to consider, as appropriate, a number of specific actions aimed at facilitating the provision of energy services to rural areas, on a priority basis.

15. In 1996, at its second session, the former Committee invited a number of States and entities within the United Nations system to consider convening a United Nations conference on energy for the twenty-first century in the year 2001. It also requested the Secretary-General to study the possibilities of strengthening the coordination of organizations and bodies of the United Nations system in the field of energy. Furthermore, it requested the Secretary-General, in consultation with regional commissions and other entities within the United Nations system, to study ways to enhance the capacity of the system in the field of energy for sustainable development.

[15] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3–14 June 1992*, vol. I, *Resolutions Adopted by the Conference* (United Nations publication, Sales No. E.93.I.8 and Corrigendum), resolution 1, annex II.

16. The Commission on Sustainable Development and the Economic and Social Council have respectively deliberated on the decisions and recommendations of the former Committee, as appropriate, which have, in turn, led to specific actions by these intergovernmental bodies. It is also apparent that activities and programmes by a number of entities within the United Nations system have been influenced by the decisions and recommendations of the former Committee. However, many Governments have not responded, as requested, to provide information on actions that they have taken in response to the decisions of the former Committee as adopted by the Council. Besides, so far only one organization within the United Nations system has provided information on the impact of the decisions of the former Committee and the extent to which the reports of former Committee sessions have been useful to their work and the extent to which the organizations have made use of such reports. The Committee noted that since the holding of the World Solar Summit on 16 and 17 September 1996 at Harare, the General Assembly, in its resolution 53/7, has invited all States Members of the United Nations to contribute to the successful implementation of the World Solar Programme 1996–2005 (A/53/395, annex).

17. The Committee on Energy and Natural Resources for Development noted that achievements have been made in improving coordination of activities relating to energy within the United Nations, and noted with appreciation the efforts of the former Committee for New and Renewable Sources of Energy and Energy for Development in this regard. It also noted that the issues raised by the former Committee have influenced views about energy and sustainable development, and that the forthcoming consideration of energy at the ninth session of the Commission on Sustainable Development is in part a result of ideas put forth by it. Also, the work of the former Committee may have provided an impetus to initiatives undertaken by various countries, such as an expert workshop on the theme "Fostering the linkage between energy and sustainable development within the international institutions", held at Vienna from 22 to 24 January 1997, and an expert meeting on renewable energy held at Vienna from 15 to 17 June 1998 by the Government of Austria. Furthermore, the body of knowledge resulting from the work of the former Committee has had an impact on the way that energy is considered in the overall problem of achieving sustainable development.

18. The Committee noted with appreciation the confidence and support that the former Committee has received from the Commission on Sustainable Development, and recognized the value of such support for the work of the present Committee. Cooperation between the Committee and United Nations entities is a matter of concern, and efforts in this area should be accelerated and the Committee should maintain close links with all United Nations agencies and entities working on energy issues. Efforts should be accelerated to encourage a wider participation in the work of the Committee, especially by NGOs concerned with energy and sustainable development and other organizations specifically dealing with energy issues, such as the Organization of Petroleum Exporting Countries (OPEC), the World Energy Council (WEC), the World Resources Institute (WRI), and the International Earth Science Information Network (ISIS). The Committee noted that other activities undertaken by the United Nations in preparation for the ninth session of the Commission on Sustainable Development may also be of interest to such NGOs, and suggested the use of electronic means to better publicize the work of the Committee as well as that of United Nations agencies and entities in the area of energy and sustainable development.

1. Environmentally sound and efficient fossil energy technologies

19. The Committee considered sub-item 5 (a) at the 4th meeting of the Sub-group.

20. The Committee had before it the report of the Secretary-General on environmentally sound and efficient fossil energy technologies (E/C.13/1998/3).

21. At the 4th meeting of the Sub-group, the representative of the Energy and Transport Branch of the Division for Sustainable Development made an introductory statement, after which statements were made by the Vice-Chairman of the Sub-group and by Mr. Meshref, Mr. Pavlovschi, Mr. Kahrobaian, and Mr. Derogan.

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22. Fossil fuels provide most of the global energy needs today. There is, however, a need to increase the efficiency of fossil energy use, improve environment and shift to fuels with lower environmental impact. For the most part, fossil energy is first converted and transformed into other energy forms before use. There are many varied opportunities for improving conversion efficiencies, e.g., for electricity conversion and oil refining. Emission reduction potentials are roughly proportional to efficiency improvements. Current technological measures to improve efficiency in the power sector include the use of combined cycle, gas-fired plants and coal-fired plants with super-critical steam cycles. Developments are also under way for flue-gas clean-up systems, integrated coal gasification combined cycles and pressurized fluidized bed combustion. There is also a large potential for carboniferous fuel cells. These technology improvements can result in significant secondary benefits, such as reductions in other pollutants. Moreover, there is a potential for near-zero emission combustion technologies and technologies for decarbonization. Associated with conversion technologies is the need to improve end-use technologies in the different sectors of the economy.

23. In 1990, 9 gigatons of oil equivalent (Gtoe) of primary energy produced 6.4 Gtoe of final energy delivered to consumers, resulting in an estimated 3.3 Gtoe of useful energy after conversion in end-use devices. The delivery of 3.3 Gtoe of useful energy left 5.7 Gtoe of rejected energy. Energy is released into the environment as low-temperature heat, with the exception of some losses and wastes, such as the incomplete combustion of fuel. The resulting global energy efficiency of converting primary to useful energy is 37 per cent.

24. Improvement in conversion efficiencies is an important measure for reducing primary energy requirements per unit of energy service and also for reducing the amount of fuels required, as well as the environmental impact at all scales. There are major opportunities for improving the efficiencies of energy use, e.g., by electricity conversion, oil refining and at the final consumer stage. Technological improvements, together with prudent maintenance and operating practices, are key factors for increasing conversion efficiencies.

25. The structure of energy end use is of critical importance for the overall efficiency of fossil energy. Indeed, the efficiency of final energy use can be more important for the overall efficiency of the full fuel cycle than the upstream efficiencies themselves. End-use technologies that are linked to particular fuels limit the flexibility for switching between different sources of fossil fuels. Since fuel cycles are driven by the demand for energy services, special attention should be given to improving the performance of end-use devices. While large opportunities exist for demand-side management and improved end-use efficiencies, barriers exist, especially in developing countries, involving market allocation failures, pricing policies, institutional impediments, consumer awareness, incentive structures, access to credit and infrastructural constraints.

26. Capital scarcity, especially in developing countries and some countries in economic transition, is a major barrier to the adoption of advanced energy technologies. Moreover, energy supply technologies compete with other developmental needs for limited capital. Measures that make supply and conversion technologies available in the market should be

put in place since they would help to resolve some of the financing difficulties by reducing risks, uncertainty and up-front capital requirements. Moreover, the removal of institutional barriers is often an important step for attracting private-sector interest in advanced technologies. In addition, regulatory reform and deregulation have enabled small and independent power producers access to the grid, thus improving their competitiveness.

27. Appropriate policies should be developed and implemented to support research, development and demonstration. Such policies should be complemented by other measures for promoting efficient and clean energy that take into account the widely differing institutional, social, economic, technical and natural resource endowment in individual countries and regions. They should also include market instruments (such as subsidies, energy and emission taxes) and regulatory measures (such as emission and fuel quality standards and codes), as well as voluntary agreements with industry.

28. The Committee noted that an important consideration in evaluating the environmentally sound and efficient fossil fuel technologies is the energy conversion process used in refining oil and generating electricity, and that inefficient facilities can be updated, improved and/or replaced. Also, the Committee concurred that substantial improvements are possible in the final use of energy by consumers. In addition, it agreed that natural gas can be utilized to a greater extent in the near term provided that the problem of leakages of methane gas is adequately addressed. Other technologies may become viable in the long term as costs are lowered, including the fuel cell. In addition, more attention is required on advanced fossil fuel technologies in order to use them as efficiently as possible, especially with regard to technological innovations related to the impact of air emissions, the need to diversify the transportation fuel base and zero-emission technologies. Also, there is a need to lower costs of technologies for meeting environmental protection goals.

29. Moreover, the scale of technology is important, and there may already be a trend under way towards smaller-sized technologies utilizing more localized distribution systems. If so, it is advisable to assess and evaluate the environmental impacts of such technologies. Other technologies, such as those used for the production of synthetic fuels, hydrogen and cleaner production and use of coal, should also be investigated. Technologies to decarbonize fossil fuel are essential if fossil fuels are to be used in an environmentally sound manner. An increased interest in and awareness of these technologies is called for, especially considering the lead time needed from the research and development stage to the actual implementation and use of such innovations.

2. Renewable sources of energy, with special emphasis on wind energy

30. The Committee considered sub-item 5 (b) at the 4th and 5th meetings of the Sub-group.

31. The Committee had before it the report of the Secretary-General on renewable sources of energy, with special emphasis on wind energy (E/C.13/1998/4).

32. At the 4th meeting of the Sub-group, the representative of the Energy and Transport Branch of the Division for Sustainable Development made an introductory statement, after which statements were made by the Vice-Chairman of the Sub-group and by Mr. Devin, Mr. Katsande, Mr. Kahrobaian and Mr. Meshref.

33. At the 5th meeting of the Sub-group, statements were made by the Vice-Chairman of the Sub-group and by Mr. Zhang, Mr. Boumaour and Mr. Derogan.

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34. The Committee considered the report of the Secretary-General on the topic to be informative and a very useful contribution to deliberations on the development of sustainable

energy systems. It recommended that, with a possible update, it should be an input to preparatory process for the ninth session of the Commission on Sustainable Development.

35. The wind potential worldwide is abundant, and the total installed capacity for wind electricity generating systems has grown rapidly in the last decade. It is currently of the order of 10,000 megawatts (MW), reflecting improved competitiveness of the resource over the years. Modern wind turbine technologies are usually classified as (a) large grid-connected, (b) intermediate-sized in hybrid systems, and (c) small stand-alone systems. Large grid-connected turbines (150 to 2,000 kilowatts (kW)) account for the biggest market, with essentially mature technology. Intermediate-sized turbines (25–150 kW) are particularly well suited for small remote grids, where fossil fuel use is limited by transportation and other constraints. Small stand-alone turbines (less than 25 kW) are used for water pumping battery charging and heating. Of the wind technologies currently in operation, the mechanical farm wind pump remains the most numerous, with more than two million units in regular use worldwide.

36. However, wind energy is site-specific and geographically uneven. The development and use of wind energy also has adverse impacts, such as noise and aesthetic problems. Because of these impacts, which are local in nature, the planning and siting of wind energy resources can cause significant concern to the local community.

37. Of the two types of wind turbines, the horizontal axis turbine is the most widely used. The average size of such turbines has increased dramatically over the past 15 years. Electricity production efficiency of these turbines is also improving.

38. Capital costs of wind energy projects are dominated by the cost of the wind turbine itself. There has, however, been a substantial decline in per-kilowatt cost, turbine and auxiliary cost. Wind energy project costs show substantial variation among countries due to such factors as site characteristics, especially the mean wind speed, market structures and planning regulations.

39. In order to promote and enhance the development and use of wind energy, the following incentive mechanisms are called for: power purchase agreements to ensure a reliable market for selling the electricity produced; production subsidy paid per kilowatt of electricity generated; tax credits based either on the capital cost of the project or on the kilowatt hours generated by the project; renewables set-aside, that is, a certain percentage of total electricity generated must come from renewable sources; externality adders — environmental externality charges; carbon tax, which adds to the cost of fossil-fuel-based energy; preferential finance — covering concessional loans at below-market interest rates; and research, development and demonstration grants.

40. It is recommended that appropriate policies, based on experience gained in a number of industrial countries, be elaborated upon in developing countries. Key elements of such policies should include the establishment of a rational pricing and well designed incentive mechanism; the provision of stable markets for wind-generated electricity; the provision of stable wind turbine markets; the alignment of energy projects' financial performance with society's environmental goals; the enhancement of community participation in project planning and in reaping project benefits; the encouragement of decentralized projects in remote communities; the removal of institutional barriers to wind energy; and the encouragement of research and development, particularly for wind resource assessment.

41. The Committee noted that the incentives recommended to promote wind energy could be applied more generally to other renewable energy technologies. The experience of Denmark in encouraging wind energy use domestically, which fostered a domestic industry that has expanded its market to exports, was particularly highlighted by the Committee as

a success story which could be emulated in other countries and perhaps for other renewable technologies. The Committee noted that "green electricity schemes" can be designed to favour electricity generated by renewables. During the process of liberalizing electricity markets, countries should undertake efforts to fully utilize such a mechanism to promote renewable energy, if appropriate. Efforts should continue to reduce production costs of wind energy so that they meet the avoided costs. It is estimated that a further reduction of the electricity generation costs of between 30 and 40 per cent is achievable. A need for funding for research and development as well as for a mapping of wind energy resources continues to exist. Attention was drawn to addressing the need for small-scale mechanical wind energy for water pumping and small-scale wind turbines for lighting, particularly in developing countries.

3. Development and implementation of rural energy policies

42. The Committee considered sub-item 5 (c) at the 5th meeting of the Sub-group.

43. The Committee had before it the report of the Secretary-General on the development and implementation of rural energy policies (E/C.13/1998/5).

44. At the 5th meeting of the Sub-group, the representative of Energy and Transport Branch of the Division for Sustainable Development made an introductory statement, after which statements were made by the Vice-Chairman of the Sub-group and by Mr. Kahrobaian, Mr. Zhang, Mr. Devin and Mr. Pavlovschi.

45. A statement was also made by the representative of Solar Cookers International, a non-governmental organization in consultative status with the Economic and Social Council.

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46. Of the estimated 3.1 billion people in rural areas, approximately 2 billion have no access to electricity and about the same number of people rely on traditional energy sources for cooking, such as wood, charcoal and animal and plant wastes, which are associated with adverse environmental effects at the local level. Rural energy policies in many countries have been concentrated on providing electricity services through grid extension, and this has required substantial subsidies to customers in remote areas with low population densities. These subsidies have resulted in a precarious financial position for some electricity-generating companies, many of which are nationally owned; a greater than optimal use of electricity; and the discouragement of the adoption of renewable energy sources. Also, in many rural areas no connection to the national grid exists. Renewable energy technologies often have cost advantages for rural areas since transportation and/or transmission costs are not a significant portion of total cost. Their successful adoption in rural areas can aid in providing modern energy services with fewer adverse environmental consequences than energy services produced from conventional fuels. Recent technical advances have lowered the cost of some services, and many countries are investigating the possibility of encouraging small decentralized systems to serve isolated rural areas.

47. In many countries, there is insufficient attention to rural development in general and to rural energy needs in particular. The lack of institutional support is partly due to the fact that rural energy is a small component of the total energy used, and is often not included in energy statistics and balances since much of it is non-commercial and thus not traded. Without government agencies taking primary responsibility for rural energy needs, few resources have been devoted to data collection and assessment, which are important steps in developing rural energy policies and the promotion of suitable energy projects specifically designed for rural areas. Agricultural policies have often failed to recognize that the

availability of adequate energy supplies can result in increased agricultural production, related increases in agro-industrial production and better market access.

48. Policies for rural development and rural energy policies should be developed and implemented in a mutually reinforcing way and appropriate government agencies within the responsible ministry for national energy policy should be assigned specific duty for rural energy, in some cases at the local or provincial levels. Policies with an inherent bias towards urban development should be reassessed, and efforts should be undertaken to ensure the availability of adequate qualitative and quantitative information on rural energy resource availability, production and consumption patterns. Rural energy policies should place high priority on the provision of electricity to unserved populations through grid connection and renewable energy technologies, with economic feasibility and social considerations taken into account. Furthermore, a rational pricing of energy should be adopted to encourage conservation and the efficient use of energy, along with differential pricing for electricity. Rural energy policies should also utilize innovative financing arrangements, including microfinancing, cooperative arrangements and licensing incentives, especially in areas where private-sector involvement in supplying energy services is encouraged.

49. The Committee recommended that countries formulate and implement national sustainable energy action programmes for agriculture and rural development. Many recommendations of the former Committee of New and Renewable Sources of Energy and Energy for Development in this regard are still relevant, including improving energy and material efficiency; developing local and indigenous energy resources, with an emphasis on renewables; and diversifying the mix of energy resources on which the national energy system depends. The Committee noted that priorities in rural areas should be placed on efficient conversion and use of biomass energy, rural electrification and solar thermal energy. It noted that solar cookers are playing a role in satisfying basic energy needs in rural areas of some countries, and are an appropriate technology for certain areas in an early stage of development. In addition, capacity-building with an emphasis on building indigenous capacity should be an integral part of rural energy policies, along with appropriate management and institutional arrangements for rural energy development. At the international level, the Committee recommended international actions for rural energy development, with the assistance of regional and international organizations, and strengthening sustainable energy activities aimed at rural energy within the United Nations system.

4. Energy and transportation

50. The Committee considered sub-item 5 (d) at the 5th meeting of the Sub-group.

51. The Committee had before it the report of the Secretary-General on energy and transportation (E/C.13/1998/6).

52. At the 5th meeting of the Sub-group, an introductory statement was made by the representative of the Energy and Transport Branch of the Division for Sustainable Development.

53. At the same meeting, statements were made by the Vice-Chairman of the Sub-group and by Mr. Devin, Mr. Zhang, Mr. Kahrobaian and Mr. Boumaour.

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54. The transportation sector has been the major source of growth for oil demand over the past 25 years, and is expected to continue to be so in the medium term. Transportation energy demand grew at an average annual rate of about 1.9 per cent during the period

1970–1994. Growth rates in the Organisation for Economic Cooperation and Development (OECD) countries and in developing countries were 1.4 and 5.3 per cent, respectively, during this period, though developing countries have a much lower level of consumption. In non-OECD Europe, there was a marginal decline in the transportation fuel demand during this period. The transportation system relies nearly completely on petroleum-based fuels, accounting for almost 60 per cent of final world oil consumption; growing concerns about its environmental impacts, particularly greenhouse gas emissions, have stimulated research and development of alternative fuels and technologies. However, alternative fuel vehicles remain a small fraction of the total world vehicle stock. Governments have a significant role to play in reducing the environmental impacts of the transportation sector by putting in place and implementing an energy policy for the transportation sector that promotes improvements in transportation efficiency and the use of alternative fuels.

55. The Committee noted that cleaner alternative fuels and new technologies can play a significant role in the transportation sector, that zero emissions are feasible, that energy efficiency can be increased by a factor of two to three in the transportation sector, and that the use of natural gas as a fuel is recommended provided that leakages are mitigated since small leakages can have a dramatic effect on climate change. In addition, the use of hydrogen as a fuel in the transportation sector could be competitive with various technologies. The private sector is engaged in research and development into a number of possible technologies to solve environmental problems in the transportation sector. One such innovation is the fuel cell vehicle under investigation by a number of companies, and the Committee noted its contribution to sustainable development efforts as well as the need for economic viability of such technologies. It also noted that efficiency gains realized since the rise in oil prices in the mid-1980s have largely been outweighed by the trend towards the use of larger passenger vehicles. Government intervention is needed either through regulatory measures and/or fiscal disincentives on larger vehicles and/or gasoline use. Greater public awareness is required about the importance of efficiency along with the advantages of alternative fuel vehicles and their safety.

56. With regard to air transport, the Committee recommended an internationally agreed upon taxation scheme for aviation fuels to alleviate adverse emissions of carbon dioxide (CO_2) to the atmosphere. It was noted with concern that air transportation is the fastest growing mode of transportation.

5. Coordination of activities of the organizations in the United Nations system in the field of energy

57. The Committee considered sub-item 5 (e) at the 5th meeting of the Sub-group.

58. The Committee had before it the report of the Secretary-General on the coordination of activities of the organizations in the United Nations system in the field of energy (E/C.13/1998/7).

59. At the 5th meeting of the Sub-group, an introductory statement was made by the representative of the Energy and Transport Branch of the Division for Sustainable Development, after which statements were made by the Vice-Chairman of the Sub-group and by Mr. Devin, Mr. Pavlovschi, Mr. Kahrobaian and Mr. Boumaour.

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60. Cooperation and coordination of activities in the field of energy is of particular importance within the United Nations system, where a wide range of activities are taking place. The main activities are in energy resources development, supply and use. The means of implementation of the programmes and activities also vary widely but on the whole have

involved the preparation of studies and reports; technical assistance, including advisory service by experts in specific fields; the organization of training workshops, seminars, meetings and conferences; and the provision of financial assistance.

61. There has been some cooperation between different entities of the United Nations system in the exchange of information and the implementation of specific projects in the field including joint formulation of such projects. Activities in energy statistics are coordinated by the Department of Economic and Social Affairs of the United Nations Secretariat, and at the intergovernmental level by the Statistical Commission. There has been enhanced and structured cooperation among the Global Environment Facility (GEF), the World Bank, the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP) and other United Nations entities in the implementation of environmentally sound energy projects. At the same time, UNDP and the World Bank have over the years been cooperating in the field of renewable energy programmes, mainly through the Energy Sector Management Assistance Programme (ESMAP). Since the World Solar Summit in 1996, UNESCO has been cooperating with other entities in the implementation of the World Solar Programme 1996–2005. Meanwhile, the Economic and Social Commission for Asia and the Pacific (ESCAP), the International Atomic Energy Agency (IAEA), the World Bank, and the United Nations Industrial Development Organization (UNIDO) are cooperating in the Database and methodologies for comparative assessment of different energy sources of electricity generation (DECADES) project, while UNEP and the World Meteorological Organization (WMO) are co-hosts of the Intergovernmental Panel on Climate Change secretariat. At the regional level, the Economic Commission for Europe (ECE) is cooperating with other organizations within and outside the United Nations in the implementation of the Energy Efficiency 2000 programme.

62. However, to date, the nature of cooperation and coordination has been meagre and somewhat ad hoc. In addition, the design and development are lacking of a common strategy for energy-related activities in the system aimed at promoting a balanced and mutually reinforcing approach to the economic, social and environmental aspects of sustainable energy development and of fostering partnership for sustainable energy development with relevant actors outside the United Nations system. Therefore, a lot needs to be done to this end. The establishment of the ad hoc Inter-Agency Task Force on Energy is a welcome first step towards greater cooperation and coordination of activities, but stronger mechanisms are required.

63. The Committee noted efforts made by the Secretariat to find a common approach to energy, and noted with appreciation that the establishment of the Inter-Agency Task Force on Energy should facilitate this task. The Committee also noted the Task Force's decision to create a formal means of exchange of information to update and coordinate activities, and suggested that the Committee be included in this system. Furthermore, an evaluation of United Nations activities in the area of energy is needed, and their impact must be assessed.

C. Other matters

64. At its 3rd meeting, on 8 April 1999, the Sub-group on Energy met with the Inter-Agency Task Force on Energy in a dialogue session to determine how to contribute to the ninth session of the Commission on Sustainable Development in a mutually supportive way.

65. The dialogue was opened by the Director of the Division for Sustainable Development.

66. Statements were made by the representatives of UNDP, the Food and Agriculture Organization of the United Nations (FAO), UNESCO, IAEA, ECE and UNEP.

67. Statements were also made by the Vice-Chairman of the Sub-group and by Mr. Bravo Trejos, Mr. Devin, Mr. Kahrobaian, Mr. Boumaour and Mr. Zhang.

Chapter III

Items considered by the Sub-group on Water Resources

A. Introduction

1. The Committee focused on key issues in water management linked to poverty alleviation and sustainable development — the provision of water supply and sanitation and the impact of agriculture and land management on the water resource base. The Committee noted that barriers to the integration of economic, social and environmental objectives persist in current approaches to water management, but that solutions can only be found if clear integrated development frameworks are agreed at all levels of society and a long-term commitment given to the development of public health and natural resource policy, strategic planning and the mobilization of resources.

2. In regard to water supply and sanitation, the Committee noted the widening gap between population and the provision of safe and reliable water supply and sanitation services. The Committee reviewed the outline of the report of the Secretary-General which will be prepared by the ACC Subcommittee on Water Resources and will be submitted to the Commission on Sustainable Development at its eighth session. The report is required to (a) provide up-to-date information on both water supply and sanitation coverage around the world; (b) evaluate the progress made in attaining the ultimate goal of providing safe water supply and sanitation for all; and (c) provide proposals for further action, particularly in developing countries and countries with economies in transition. The Committee discussed the basic purpose of the report and the current progress on coverage and sustainability, and prepared a resolution to enhance the report.

3. The Committee stressed that integrated approaches to water resources management within which the sustainable provision of water supply and water-related sanitation can be achieved are critical, but that this principle is not well recognized in many countries. Existing practices, policies and sectoral planning are in many cases actually impeding progress and resulting in inequitable access to these vital services and a high absorption of economic and environmental externalities by beneficiaries.

4. A key consideration by the Committee was the continuing lag in the provision of sanitation services in relation to water supply. While developed countries consider water-based sanitation, developing countries will need to rely on the provision of infrastructure for human and solid waste disposal with complementary health and hygiene programmes. Equally, sanitation sewage treatment, recycling and reuse of wastewater have to be seen as an integral part of water management. This consideration is essential to allow water supply provision to produce the intended health benefits for socio-economic development.

5. In evaluating the progress made so far during the water and sanitation decade, the Committee recognized a set of key issues that will determine the ultimate sustainability of water supply and sanitation: (a) promotion of political will; (b) economic sustainability and private sector involvement; (c) community participation and social mobilization; (d) sanitation and sewage treatment, and wastewater recycling and reuse; (e) communication and awareness-raising; (f) gender issues; (g) protection of water sources; and (h) water conservation and efficiency.

6. In the opinion of the Committee, the establishment of policy, legislative and regulatory frameworks to enable the accelerated implementation of water supply and sanitation strategies by Governments will be critical not only in ensuring equitable access to the services to attain public health goals but also in the mobilization of public and private

resources to implement strategies. Equity and efficiency considerations must be carefully balanced through competent regulation that should aim to promote responsible intervention by public and private-sector agencies whenever their comparative advantage is greatest.

7. The Committee recognized the pivotal role of communication and awareness-raising in water and sanitation at all levels, and suggested that persistent efforts to improve and accelerate these initiatives will be required to maintain levels of interest and concern. Specifically, the role of community participation and social mobilization will need to be enhanced so that the provision of services can be truly demand-led. Communities should be encouraged to form partnerships with relevant water agencies to promote initiatives in the protection of the water resource base through conservation, efficient use and pollution prevention. Here, the role of women as ultimate managers of water and land resources needs fuller recognition, and barriers to their participation in local management issues need to be progressively removed.

8. With regard to the linked issues of land and water, the Committee recognized that societal pressures to produce more food are resulting in intensified economic competition for the water resource base. However, the economic and environmental externalities produced from the close and increasingly intense interaction between freshwater and land use are becoming increasingly complex and difficult to manage.

9. The Committee noted the dependency of agriculture on water resources for both rain-fed and irrigated agriculture, but also stressed the impact of agriculture on the water resource base through high levels of consumptive use and the degradation of water quality. The scope for improving the productive use of water in agriculture through improved technologies, outreach and community participation and clear economic and environmental regulation was stressed, but this will need to occur in the appropriate catchment, basin or aquifer framework. The positive engagement with the natural resource base is essential not only to maintain local and national food security but also to offer opportunities for balanced rural development. However, in this intensification of use, the integrity of the natural systems in sustaining water and land systems always needs to be respected, and the role of soil conservation measures to combat erosion and salinization in such integrated approaches will be pivotal in sustaining productive land.

10. The Committee took note of the Harare expert group meeting in January 1998, which concluded that integrated water resources management is essential for reconciling the interests of all actors in the river basin — whether national or international — regarding water quantity, quality and ecosystem protection. A constructive dialogue must thus be made possible at the basin level to develop a consensus between land as well as water users and stakeholders, and to integrate these concerns in national socio-economic frameworks. Strategies should be specific on methods of pollution avoidance to ensure sequential water reuse downstream, and the integration between land use, water management and waste management should be reflected in the approach to human health, nutrition, employment, poverty eradication and ecosystem health.

11. The Committee noted that in accordance with the mandate given by the Economic and Social Council in 2000, the Commission on Sustainable Development will focus on integrated planning and management of its land resources as its sectoral theme and agriculture as its economic sector, with poverty and consumption and production patterns as "overriding themes". The Committee recognized that while chapters 10 and 14 of Agenda 21 provide the main basis for land and agricultural topics, there is a need to take an integrated approach to the protection and sustainable management of land and soil resources. Accordingly, the Committee recommended specific revisions of the report of the Secretary-General on issues related to the spatial planning of land (including minerals) and water

resources to highlight the issues to the Commission on Sustainable Development in 2000 (E/C.7/1998/5).

B. Contribution to the preparation of the report of the Secretary-General on progress made in providing safe water supply and sanitation for all during the 1990s, to be submitted to the Commission on Sustainable Development at its eighth session

12. The Committee considered agenda item 4 at the 1st and 2nd meetings of its Sub-group on Water Resources, on 6 April 1999, and at its 3rd meeting, on 9 April 1999. It had before it for information the report of the Secretary-General on freshwater, including clean and safe water supply and sanitation (E/1997/70), and the report of the Secretary-General on progress made in providing safe water supply and sanitation for all during the first half of the 1990s (A/50/213–E/1995/87).

13. At the 1st and 2nd meetings of the Sub-group, the Vice-Chairman of the Sub-group, John Michael Matuszak, made statements.

14. At the same meetings, statements were made by Ms. Falkenmark, Mr. Nishat, Mr. Smith, Mr. Hungspreug, Mr. Aguilar Molina, Mr. Natalchuk, Mr. Mäkelä, Mr. Katsande and Mr. Kankhulungo.

15. Also at the same meetings, statements were made by the Chief of the Water Management and Small Island Developing States Branch of the Department of Economic and Social Affairs, and by the representatives of the Division for Sustainable Development.

Action taken by the Committee

16. At its 3rd meeting, on 9 April 1999, the Committee had before it an informal paper containing a draft resolution entitled "Contribution to the preparation of the report of the Secretary-General on progress made in providing safe water supply and sanitation for all during the 1990s".

17. At the same meeting, the Committee adopted the draft resolution (see chap. I, sect. A, draft resolution I).

C. Issues related to assessment and management of land and water resources on an integrated basis

1. Contribution to the preparatory process for the eighth session of the Commission on Sustainable Development on integrated planning and management of land resources and on agriculture

18. The Committee considered agenda item 6 (a) at the 3rd to 5th meetings of its Sub-group on Water Resources, on 7 and 8 April 1999, and at its 4th meeting, on 16 April 1999. It had before it the report of the Secretary-General on issues related to the spatial planning of land (including minerals) and water resources (E/C.7/1998/5).

19. At the 3rd meeting of the Sub-group, on 7 April, the Vice-Chairman of the Sub-group made a statement.

20. At the same meeting, the representative of FAO made a statement.

21. Also at the same meeting, statements were made by the Chief of the Water Management and the Small Island Developing States Branch and by the representatives of the Division for Sustainable Development.

22. At the same meeting, statements were made by Ms. Falkenmark, Mr. Hungspreug, Mr. Natalchuk, Mr. Kankhulungo, Mr. Aguilar Molina, Mr. Mäkelä and Mr. Nishat.

23. At the 4th meeting of the Sub-group, on 7 April, statements were made by Mr. Nishat, Ms. Falkenmark, Mr. Aguilar Molina, Mr. Mäkelä, Mr. Smith, Mr. Hungspreug and Mr. Natalchuk.

24. At the same meeting, a statement was made by the representative of the Division for Sustainable Development.

25. At the 5th meeting of the Sub-group, on 8 April 1999, statements were made by the Vice-Chairman of the Sub-group and by Ms. Falkenmark, Mr. Kasme, Mr. Nishat, Mr. Hungspreug, Mr. Aguilar Molina, Mr. Mäkelä, Mr. Katsande and Mr. Kankhulungo.

2. Review of coordination of activities of the organizations of the United Nations system in the field of freshwater resources

26. The Committee considered agenda item 6 (b) at the 5th meeting of its Sub-group on Water Resources, on 8 April 1999.

27. At the same meeting, the Chairman of the ACC Subcommittee on Water Resources made a statement, which was followed by a dialogue in which the Vice-Chairman of the Sub-group, Ms. Falkenmark, Mr. Kasme, Mr. Natalchuk, Mr. Nishat and Mr. Aguilar Molina participated.

Action taken by the Committee

28. At its 4th meeting, on 16 April, the Committee had before it a draft resolution submitted by the Vice-Chairman, Mr. John Matuszak, on the basis of informal consultations, entitled "Contribution to the preparatory process for the eighth session of the Commission on Sustainable Development: integrated planning and management of land resources and on agriculture" (E/C.14/1999/L.2).

29. At the same meeting, Mr. Aguilar Molina orally revised the draft resolution as follows:

(a) In the operative paragraph, section 1, first subparagraph, the words "The potential water crisis" were replaced by the words "The water crisis";

(b) In the operative paragraph, section 1, the second subparagraph, which had read:

"Conciliation of water availability and agricultural planning without transboundary agreements between States to allocate water and guarantee availability"

was revised to read:

"Conciliation of water availability and agricultural planning within or without transboundary agreements between States to allocate water and guarantee availability".

30. Also at the same meeting, the Committee adopted the draft resolution as orally revised (see chap. I, sect. A, draft resolution II).

31. At the same meeting, the Committee had before it a draft resolution submitted by the Vice-Chairman Mr. John Matuszak, on the basis of informal consultations, entitled "Report of the Secretary-General on issues related to the spatial planning of land (including minerals) and water resources (E/C.14/1999/L.3).

32. Also at the same meeting, Mr. Aguilar Molina orally revised the draft resolution by deleting, in the annex, section II, first sentence, the word "looming" before the words "water crisis".

33. At the same meeting, the Committee adopted the draft resolution as orally revised (see chap. I, sect. A, draft resolution III).

34. Also at the same meeting, on 16 April, on the proposal of the Chairman, the Committee adopted a draft decision on the possibility of convening a meeting on the environmental effects of small-scale and artisanal mining operations (see chap. I, sect. C, decision 1/2).

Chapter IV

Provisional agenda for the second session of the Committee

1. The Committee considered item 8 at its 4th meeting, on 16 April 1999. It had before it an informal paper containing the draft provisional agenda for its second session.

2. At the same meeting, the Committee decided to approve the provisional agenda and documentation for its second session (see chap. I, sect. B, draft decision II).

Chapter V

Adoption of the report of the Committee on its first session

1. The Committee considered item 9 at its 4th meeting, on 16 April 1999. It had before it the draft report on its first session (E/C.14/1999/L.1 and Add.1).

2. At the same meeting, the Committee decided to approve its draft report (see chap. I, sect. B, draft decision II).

Chapter VI

Organization of the session

A. Opening and duration of the session

1. The Committee on Energy and Natural Resources for Development held its first session at United Nations Headquarters from 5 to 16 April 1999. The Committee held 4 meetings (1st to 4th) and a number of informal meetings.

2. The session was opened by the Director of the Division for Sustainable Development.

3. In accordance with paragraph 15 of annex I to Economic and Social Council resolution 1998/46 of 31 July 1998 on further measures for the restructuring and revitalization of the United Nations in the economic, social and related fields, the Committee comprised two sub-groups, one on energy and one on water resources. The Sub-group on Energy held 5 meetings and the Sub-group on Water Resources held 5 meetings.

B. Membership and attendance

4. Twenty-three members of the Committee attended the first session: Adam Edow Adawa (Kenya), Carlos Alberto Aguilar Molina (El Salvador), Messaoud Boumaour (Algeria), Hernan Bravo Trejos (Costa Rica), Dmytro Victorovych Derogan (Ukraine), Bernard Devin (France), Malin Falkenmark (Sweden), Siripong Hungspreug (Thailand), Jon Ingimarsson (Iceland), Ahmad Kahrobaian (Islamic Republic of Iran), Badr Kasme (Syrian Arab Republic), Christian M. Katsande (Zimbabwe), Owen Macdonald Kankhulungo (Malawi), Markku Juhani Mäkelä (Finland), John Michael Matuszak (United States of America), Wafik Meshref (Egypt), Sergey M. Natalchuk (Russian Federation), Ainun Nishat (Bangladesh), Neculai Pavlovschi (Romania), Eddy Kofi Smith (Ghana), Wilhelmus C. Turkenburg (Netherlands), Raymond Marcio Wright (Jamaica) and Zhang Guocheng (China).

5. The following States Members of the United Nations were represented by observers: Kazakhstan, Malawi, Republic of Korea and Zimbabwe.

6. The Economic Commission for Europe and the Regional Commissions New York Office were represented.

7. The following United Nations bodies and specialized agencies and related organizations were represented: UNDP, UNEP, FAO, UNESCO and IAEA.

8. The International Chamber of Commerce (ICC) and Solar Cookers International, non-governmental organizations in consultative status with the Economic and Social Council, were represented.

C. Election of officers

9. At its 1st meeting, on 5 April, the Committee elected Christian M. Katsande (Zimbabwe) as Chairman by acclamation.

10. At its 2nd meeting, on 5 April, the Committee elected the following officers by acclamation:

Vice-Chairmen:
Owen Macdonald Kankhulungo (Malawi)
John M. Matuszak (United States of America)
Wafik Meshref (Egypt)
Wilhelmus C. Turkenburg (Netherlands)

11. Also at the 2nd meeting, it was decided that Mr. Turkenburg would serve as Chairman and Mr. Meshref as Rapporteur of the Sub-group on Energy, and that Mr. Matuszak would serve as Chairman and Mr. Kankhulungo as Rapporteur of the Sub-group on Water Resources.

D. Agenda

12. At its 1st meeting, on 5 April, the Committee had before it the provisional agenda for the session, as contained in document E/C.14/1999/1.

13. At the same meeting, the Committee orally amended the provisional agenda as follows:

(a) A subparagraph was added to agenda item 5, which read:

"(e) Coordination of activities of the organizations in the United Nations system in the field of energy";

(b) Two subparagraphs were added to agenda item 6, which read:

"(a) Contribution to the preparatory process for the eighth session of the Commission on Sustainable Development on integrated planning and management of land resources and on agriculture";

"(b) Review of coordination of activities of the organizations of the United Nations system in the field of freshwater resources".

14. At the same meeting, the Committee adopted the provisional agenda, as orally amended, as follows:

1. Election of officers.
2. Adoption of the agenda and organization of work.
3. Contribution to the preparatory process for the ninth session of the Commission on Sustainable Development.
4. Contribution to the preparation of the report of the Secretary-General on progress made in providing safe water supply and sanitation for all during the 1990s, to be submitted to the Commission on Sustainable Development at its eighth session.
5. Review of salient trends and issues on energy development and use in the context of sustainable development:
   (a) Environmentally sound and efficient fossil energy technologies;
   (b) Renewable sources of energy, with special emphasis on wind energy;
   (c) Development and implementation of rural energy policies;
   (d) Energy and transportation;
   (e) Coordination of the activities of the organizations in the United Nations system in the field of energy.

6. Issues related to assessment and management of land and water resources on an integrated basis:

   (a) Contribution to the preparatory process for the eighth session of the Commission on Sustainable Development on integrated planning and management of land resources and on agriculture;

   (b) Review of coordination of activities of the organizations of the United Nations system in the field of freshwater resources.

7. Other matters

8. Provisional agenda for the second session of the Committee.

9. Adoption of the report of the Committee on its first session.

E. Documentation

15. The documents before the Committee at its first session are listed in the annex.

Annex

Documents before the Committee at its first session

Document number	*Agenda item*	*Title or description*
E/C.14/1999/1	2	Provisional agenda and annotations
E/C.13/1998/2	5	Report of the Secretary-General on the follow-up to previous sessions of the Committee on New and Renewable Sources of Energy and on Energy for Development
E/C.13/1998/3	5	Report of the Secretary-General on environmentally sound and efficient fossil energy technologies
E/C.13/1998/4	5	Report of the Secretary-General on renewable sources of energy, with special emphasis on wind energy
E/C.13/1998/5	5	Report of the Secretary-General on the development and implementation of rural energy policies
E/C.13/1998/6	5	Report of the Secretary-General on energy and transportation
E/C.13/1998/7	5	Report of the Secretary-General on the coordination of activities of the organizations in the United Nations system in the field of energy
E/C.7/1998/5	6	Report of the Secretary-General on issues related to the spatial planning of land (including minerals) and water resources
E/C.14/1999/L.1 and Add.1	9	Draft report of the Committee
E/C.14/1999/L.2	6 (a)	Draft resolution submitted by the Vice-Chairman, Mr. John Matuszak, on the basis of informal consultations, entitled "Contribution to the preparatory process for the eighth session of the Commission on Sustainable Development: integrated planning and management of land resources and agriculture"
E/C.14/1999/L.3	6 (a)	Draft resolution submitted by the Vice-Chairman, Mr. John Matuszak, on the basis of informal consultations, entitled "Report of the Secretary-General on issues related to the spatial planning of land (including minerals) and water resources"
E/1997/70	4	Report of the Secretary-General on freshwater, including clean and safe water supply and sanitation
A/50/213-E/1995/87	4	Report of the Secretary-General on progress made in providing safe water supply and sanitation for all during the first half of the 1990s

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